

## User's Manual



## *SW AV Series*

Video and Audio Switchers

# Precautions

## Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

**Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conservier les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

## 安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### Avertissement

**Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

**Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un ype équivalent recommandé par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

### Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden.

Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

### Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

### 警告

**电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

**拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

**电源线保护** • 妥善布线，避免被踩踏，或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

# Quick Start — SW AV Series Switchers

## Installation

### Step 1 — Power down

Turn off power to the input and output devices, and remove the power cords from them.

### Step 2 — Mounting

If desired, mount the switcher in a rack or under a table.

### Step 3 — Inputs

As applicable to your switcher, connect:

- a** Up to 4, 6, 8, or 12 S-video inputs to the Input connectors.
- or — **b** Up to 4, 6, 8, or 12 composite video inputs to the Input connectors.
- c** Up to 4, 6, 8 or 12 unbalanced stereo audio inputs to the input RCA connectors.
- or — **d** Up to 4, 6, 8 or 12 balanced or unbalanced stereo audio inputs to the input captive screw connectors.



### Step 4 — Outputs

As applicable to your switcher, connect:

- a** An S-video display or other device to the Output B connector.
- b** 1 or 2 composite video displays or other devices to the Output connector(s).
- c** An unbalanced stereo audio device to the output A connectors.



S-video Switcher

Composite Video Switcher

OUTPUT A

L

R

OUTPUT B

L R

RCA Connector Audio Switcher

OUTPUTS

L A R L B R

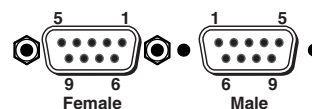
Captive Screw Audio Switcher

- d** 1 or 2 balanced or unbalanced stereo audio devices to the output connectors.

### Step 5 — Remote/RS-232

If desired, connect a control system, computer, or contact closure device (SW 4 and SW 6 models only) to the Remote (SW 4 and SW 6 models only)/RS-232 (SW8 and SW12 models only) port.

### 5, Cont'd



Pin	RS-232	Contact closure	Function
1	—	In#1 *	Input #1 *
2	TX	—	Transmit data (-)
3	RX	—	Receive data (+)
4	—	In#2 *	Input #2 *
5	Gnd	Gnd	Signal ground
6	—	In#3 *	Input #3 *
7	—	In#4 *	Input #4 *
8	—	In#5 †	Input #5 †
9	—	In#6 †	Input #6 †

\* SW 4 and SW 6 models only

† SW 6 models only

### Step 6 — External Sync

If desired, feed a black burst (gen lock) signal to the external sync connectors.



### Step 7 — Power up

Plug the switcher and input and output devices into a grounded AC source. Turn on the input and output devices.

## Front Panel Controls

**I/O button** selects video, audio, or both for input selection.

**NOTE** The I/O button has no function on audio-only switchers.

**Video and Audio LEDs** indicate whether video, audio, or both are selected.

**NOTE** The Audio LED is always lit on audio-only switchers.

**Input buttons** select inputs for output. Input buttons 1, 2, 3, and 4 also select the switcher mode.

**Input LEDs** identify the input selected for output. Breakaway audio is indicated by a blinking input LED. The first four input LEDs also indicate audio gain settings.

**Audio configuration/save button and LED** enable the user to view and/or change the current audio level setting for each input.

**Down (▼) and Up (▲) buttons and LEDs** decrease or increase the audio level for the selected input and indicate the decrease and increase.

**-dB/+dB LEDs** indicate the polarity (- = attenuation, + = gain) of the audio level setting.

## Quick Start — SW AV Series Switchers, cont'd

**Audio level indicators** (Input 1 through Input 4 LEDs) each indicate a range of 6dB when lit:  
Input 1 LED: off = 0 dB to 5dB,  
Input 1 LED: lit = 6dB to 11dB,  
Input 1 and 2 LED: lit = 12dB to 17dB, and so on.

**Mode button** (video switchers) is used with the Normal, Auto, or Executive button to select the switching or executive mode. *A secondary function of the Input 1 button.*

**Normal button** (video switchers) is used with the Mode button to select normal mode. *A secondary function of the Input 2 button.*

**Auto(switch) button** (video switchers) is used with the Mode button to select autoswitching mode. *A secondary function of the Input 3 button.*

**Auto Switch Active LED** (video switchers) indicates that the switcher is in autoswitch mode. When unlit, the switch is in normal (manual) mode.

**Executive Mode button** (audio switchers) is used with the Mode button to toggle executive mode on and off. *An unlabeled secondary function of the Input 4 button.*

**Executive Mode LED** (audio switchers) indicates that the switcher is in executive mode. All front panel operations except input selection are locked.

## Operation

### Power

Plug in the switcher to apply power. The switcher performs a self-test that blinks the LEDs. An error-free self-test leaves the autoswitch mode, executive mode, video and/or audio selection, input selection, and the audio settings in the same configuration as they were when power was removed.

### Switching inputs

Video and audio switchers can switch audio with video (audio follow) or either can be switched separately (audio breakaway). Select an input as follows:

**NOTE** *Video switchers must be in normal (manual) mode.*

1. **(Video switchers only)** Press the I/O button as necessary to select video, audio, or both.
2. Press the associated input button to select the desired input.
3. Observe that the LED for the selected input lights or blinks.

### Audio gain and attenuation (audio switchers)

The audio level of each input can be adjusted through a range of -18dB to +24dB.

**NOTE** *Video (autoswitching) switchers must be in normal (manual) mode.*

1. **(Video switchers only)** Press the I/O button to select either video and audio or audio only.
2. Press and release an input button to select an input.
3. Press and **hold** the Audio Conf/Save button until the Audio Conf/Save LED begins to blink, then release the Audio Conf/Save button.

Each of the input 1 through 4 LEDs displays a range of 6dB for the selected input when lit. The +dB and -dB LEDs display the polarity (+ or -).

4. Press and release the ▲ and ▼ buttons to increase and decrease the audio level by 1dB or press and hold the buttons to increase or decrease the level by 3dB per second.
5. Press and hold the Audio Conf/Save button until the Audio Conf/Save LED turns off to save the gain value in memory and exit the audio display and adjustment mode.

### Switch mode (video switchers)

In autoswitch mode, the switcher selects the highest-numbered input with sync signals present. The front panel LEDs remain functional.

**NOTE** *Audio breakaway is disabled.*

Toggle autoswitch mode on and off as follows:

1. Press and **hold** the Mode (Input 1) button.
2. Press and release either the Auto (Input 3) or Normal (Input 2) button. The Auto Switch Mode Active LED lights or goes out.
3. Release the Mode button.

### Executive mode (audio switchers)

Executive mode disables the front panel I/O button, autoswitch or normal switch mode selection, and all audio gain and attenuation functions.

Toggle executive mode on and off as follows:

1. Press and **hold** the Mode (Input 1) button.
2. Press and release the Input 4 button. The Executive Mode LED changes state (lit to off or off to lit).
3. Release the Mode button.

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## SW AV Series Switchers

# 1 Chapter One

## Introduction

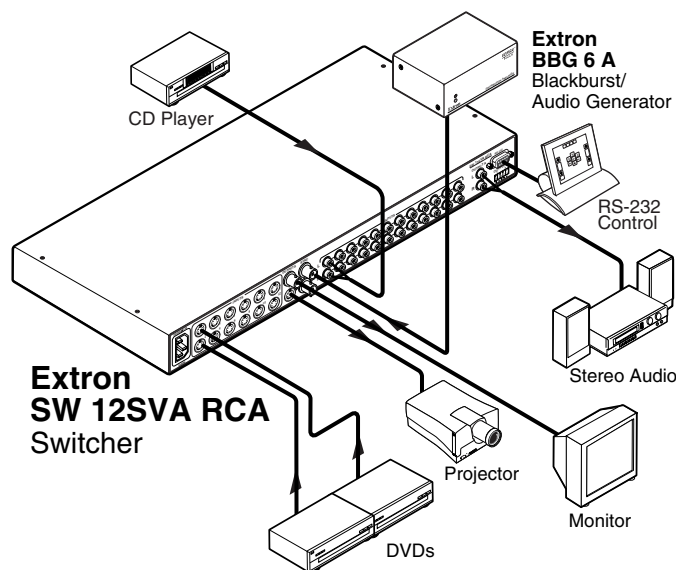
About the Switchers

Features

# Introduction

## About the Switchers

The Extron SW AV series (figure 1-1) is a family of video and/or audio switchers with a wide array of input and output configurations, video formats, and audio connections. The switchers route S-video (luminance (Y) and chrominance (C)), and/or composite video, and/or unbalanced audio on RCA connectors, and/or balanced or unbalanced audio on captive screw connectors. The table on the following page lists the models and the combinations of inputs and outputs available in the SW AV family.



**Figure 1-1 — Typical SW 12SVA RCA application**

## Features

### Video switchers

#### S-video (SV) models

**Inputs** — S-video switchers input 4, 6, 8, or 12 luminance and chrominance signals on 4-pin mini DIN connectors.

**Outputs** — The selected S-video input is split, buffered, and output on 2 connectors.

- One S-video output on a 4-pin mini DIN connector.
- One encoded composite video output on a female BNC connector.

**Bandwidth** — Bandwidth is 250 MHz (-3dB). This high bandwidth allows the switchers to switch all of the quad standard video formats with no loss of signal quality.

#### Composite video (V) models

**Inputs** — Composite video switchers input up to 4, 6, 8 or 12 composite video signals on female BNC connectors.

**Outputs** — The selected composite video input is split, buffered, and output on 2 female BNC connectors.



Model	Part #	Inputs				Outputs			
		Video	S-video	Captive screw audio	RCA audio	Video	S-video	Captive screw audio	RCA audio
SW 4AV	60-484-21	4	No	4	No	2	No	2	No
SW 4AV RCA	60-484-31	4	No	No	4	2	No	1	1
SW 4SVA	60-484-22	No	4	4	No	1	1	2	No
SW 4SVA RCA	60-484-32	No	4	No	4	1	1	1	1
SW 6V	60-487-01	6	No	No	No	2	No	No	No
SW 6AV	60-487-21	6	No	6	No	2	No	2	No
SW 6AV RCA	60-487-31	6	No	No	6	2	No	1	1
SW 6SV	60-487-02	No	6	No	No	1	1	No	No
SW 6SVA	60-487-22	No	6	6	No	1	1	2	No
SW 6SVA RCA	60-487-32	No	6	No	6	1	1	1	1
SW 6A	60-487-20	No	No	6	No	No	No	2	No
SW 6A RCA	60-487-30	No	No	No	6	No	No	1	1
SW 8V	60-482-01	8	No	No	No	2	No	No	No
SW 8AV	60-482-21	8	No	8	No	2	No	2	No
SW 8AV RCA	60-482-31	8	No	No	8	2	No	1	1
SW 8SV	60-482-02	No	8	No	No	1	1	No	No
SW 8SVA	60-482-22	No	8	8	No	1	1	2	No
SW 8SVA RCA	60-482-32	No	8	No	8	1	1	1	1
SW 8A	60-482-20	No	No	8	No	No	No	2	No
SW 8A RCA	60-482-30	No	No	No	8	No	No	1	1
SW 12V	60-483-01	12	No	No	No	2	No	No	No
SW 12AV	60-483-21	12	No	12	No	2	No	2	No
SW 12AV RCA	60-483-31	12	No	No	12	2	No	1	1
SW 12SV	60-483-02	No	12	No	No	1	1	No	No
SW 12SVA	60-483-22	No	12	12	No	1	1	2	No
SW 12SVA RCA	60-483-32	No	12	No	12	1	1	1	1
SW 12A	60-483-20	No	No	12	No	No	No	2	No
SW 12A RCA	60-483-30	No	No	No	12	No	No	1	1

**Bandwidth** — Bandwidth is 250 MHz (-3dB). This high bandwidth allows the switchers to switch all of the quad standard video formats with no loss of signal quality.

#### All video models

**Input sensing** — The switcher continuously monitors all inputs to sense when the input signal is active or inactive. The switcher reports changes in the status of each input (active to inactive or inactive to active) on the RS-232 port.

**Autoswitching mode** — When autoswitching is enabled, the switcher automatically switches to the highest-numbered input with video sync pulses present. If video is absent from all inputs, input 1 is selected.

## Introduction, cont'd

**External sync input and output connectors** — Allow the switcher to use a black burst (genlock) signal to synchronize switching during the vertical interval. This ensures glitch-free switching among multiple timed sources.

### Audio switchers

#### Captive screw connector (A) models

**Inputs** — These switchers input 4, 6, 8, or 12 balanced or unbalanced stereo audio signals, on 3.5 mm, 5-pole captive screw terminals.

**Outputs** — The selected audio input is split, buffered, and output as 2 balanced or unbalanced audio signals, on 3.5 mm, 5-pole captive screw terminals.

#### RCA connector (A RCA) models

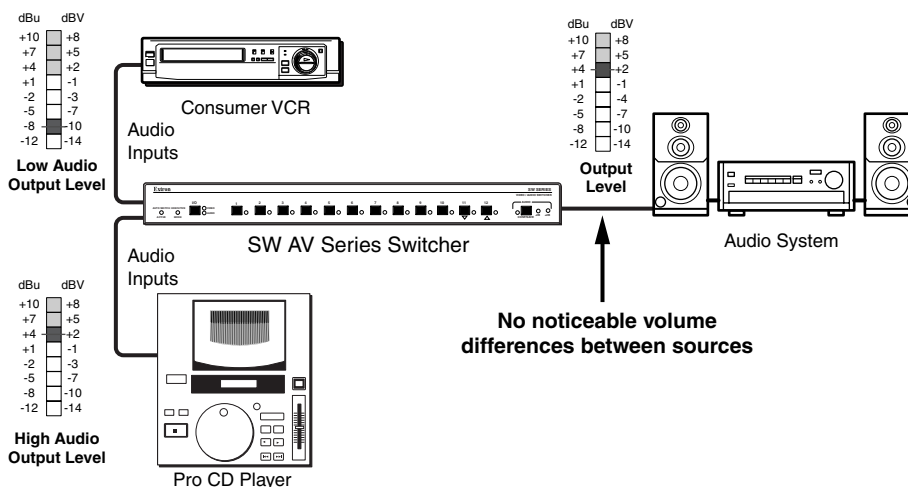
**Inputs** — These switchers input 4, 6, 8, or 12 unbalanced stereo audio signals on left and right RCA connectors.

**Outputs** — The selected audio input is split, buffered, and output on 2 sets of connectors.

- One balanced or unbalanced audio signal, on a 3.5 mm, 5-pole captive screw terminal.
- One unbalanced stereo audio signal on left and right RCA connectors.

#### All audio models

**Audio gain/attenuation** — Users can set the input level of audio gain or attenuation (-18 dB to +24 dB) via the RS-232 link or from the front panel. Individual input audio levels can be adjusted so there are no noticeable volume differences between sources (figure 1-2) and for the best headroom and signal-to-noise ratio. This function also eliminates the need for separate preamps or attenuators when used with professional (higher line level) and consumer (lower line level) audio equipment.



**Figure 1-2 — Audio gain and attenuation**

---

**Audio follow** — If the switcher is also a video model, audio can be switched with the corresponding video input. Audio follow switching can be done via front panel control or under RS-232 remote control.

**Audio breakaway** — If the switcher is also a video model, audio can be broken away from its corresponding video input signal. Audio breakaway switching can be done via front panel control or under RS-232 remote control.

**Executive mode (front panel security lockout)**— All switchers that route audio have an executive mode that locks out the I/O (video/audio/video and audio) selection button, toggling between autoswitch and normal mode, and all audio gain and attenuation adjustments at the front panel. If a switcher is installed in an open area, where operation by unauthorized personnel may be a problem, the switcher can be placed in executive mode. When the front panel is locked, a special button combination is required to unlock the front panel controller before audio gain and attenuation can be adjusted locally.

When the front panel is locked out, audio gain and attenuation is still available via the RS-232 link.

## All switcher models

**Operational flexibility** — The operator can select the input, set the audio gain and attenuation for each input, set the switch mode, and toggle executive mode on and off using:

- **Front panel controller** — The SW AV series front panel controller supports touch-of-a-button input selection, audio gain and attenuation control, switch mode selection, and executive mode selection.
- **RS-232 control** — The switcher's RS-232 link on the RS-232 (SW 8 and SW 12 models) or Remote (SW 4 and SW 6 models) port. The RS-232 link allows remote control via a PC or control system.
  - **Windows-based control program** — Extron's Windows-based control program provides a versatile range of operational options with its graphical interface and drag-and-drop/point-and-click operation.
  - **Simple Instruction Set (SIS™)** — The Simple Instruction Set program lets a host computer control the switcher with simple commands.
  - **Optional infrared remote control** — The operator can also control the switcher using Extron's IR 102 Universal remote control kit (part #70-224-01) connected to the RS-232 or Remote port.
- **Contact closure (4-input and 6-input models only)** — The operator can remotely control the SW 4 and SW 6 switchers using a contact closure keypad connected to the Remote port. The switcher's contact closure link on the Remote port.

**Rack mount** — Rack-mountable in any conventional 19" wide rack with the included rack ears.

**Power supply** — Includes an internal 100 VAC to 240 VAC, 50/60 Hz, 15 watts, autoswitchable power supply, which provides worldwide power compatibility.

## **Introduction, cont'd**

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## SW AV Series Switchers

# Chapter Two

## Installation

Installation Overview

Mounting the Switcher

Cabling and Rear Panel Views

# Installation

---

## Installation Overview

To install an SW AV Series switcher, do the following:

- 1** Turn off the input and output devices, and unplug their power cords.
- 2** If desired, mount the switcher in a rack or under furniture (see *Mounting the Switcher* below).
- 3** Connect the input and output devices to the switcher (see *Cabling and Rear Panel Views* on page 2-3).
- 4** **(SW 8 and SW 12 models)** If desired, connect a computer or an RS-232 control system to the RS-232 connector (see *Remote connection* on page 2-6).  
**(SW 4 and SW 6 models)** If desired, connect a computer, an RS-232 control system, an IR device (such as the IR 102 remote control kit), or a contact closure device (such as a KP 6 Keypad Remote Control) to the Remote connector (see *Remote connection* on page 2-6).
- 5** If desired, connect a black burst (genlock) signal to the external sync connectors (see *External sync connection* on page 2-6).
- 6** Plug the switcher and, if appropriate, the input devices and output devices into a grounded AC source.
- 7** Turn on the input and output devices.
- 8** The image from each input device should appear on the output devices when you switch from one input device to another. If this does not happen, double check steps 3 through 5 and make adjustments as needed.

## Mounting the Switcher

### Tabletop use

For tabletop use, affix a self-adhesive rubber foot to each corner of the bottom of the switcher.

### Rack mounting the switcher

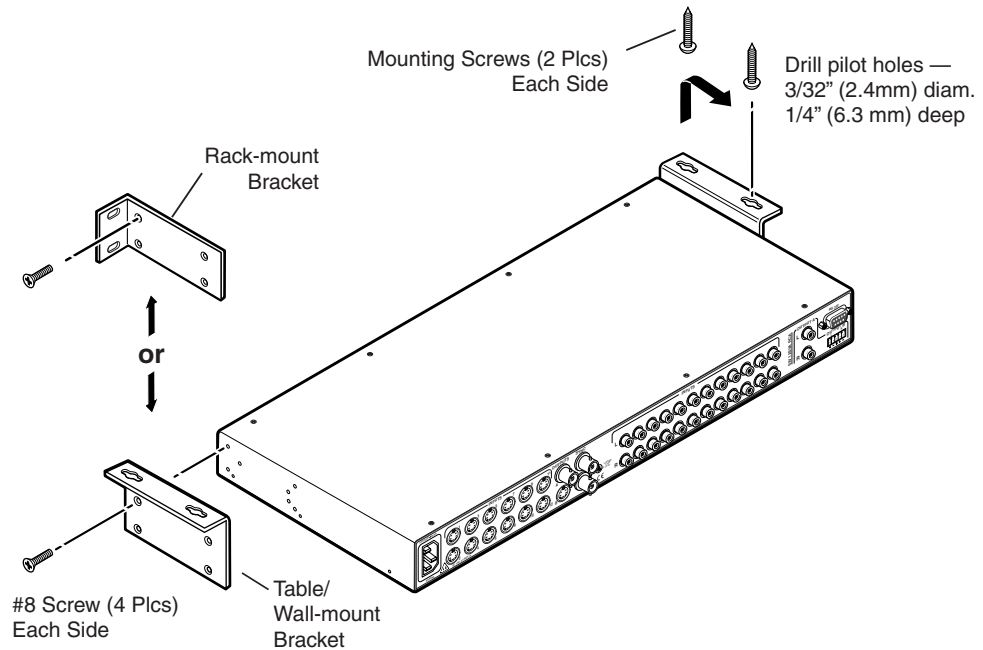
The SW AV switcher models are housed in rack-mountable, 1U high, 17" wide metal enclosures. The appropriate rack mount kit is included with each switcher. Rack mount the switcher as follows:

1. If feet were previously installed on the bottom of the switcher, remove them.
2. Attach the rack mount brackets to the switcher with the eight #8 machine screws provided (figure 2-1).
3. Insert the switcher into the rack, align the holes in the mounting bracket with those of the rack.
4. Secure the switcher to the rack using the supplied machine screws.

### Furniture mounting the switcher

The SW AV switcher models can be mounted under a table or other horizontal surface with an optional Extron MBD 129 Through-Desk Mount Kit, part #70-077-02.

1. Secure the optional table/wall mounting brackets to the switcher with the eight machine screws provided in the mounting kit (figure 2-1).
2. Hold the switcher with attached brackets against the underside of the desk or other furniture. Mark the location of holes for screws on the underside of the desk.



**Figure 2-1 — Mounting the switcher**

3. Drill 1/4" (6.4 mm) deep, 3/32" (2 mm) diameter pilot holes in the table or desk at the marked screw locations from the underside/inside (concealed side) of the furniture, where the switcher will be located.
4. Insert the four wood screws into the pilot holes. Fasten each screw into the installation surface until just less than 1/4" of the screw head protrudes.
5. Align the installed screws with the slots in the mounting brackets, and place the switcher against the surface, with the screws through the bracket slots.
6. Slide the switcher slightly forward or back, then tighten all four screws to fasten it in place.

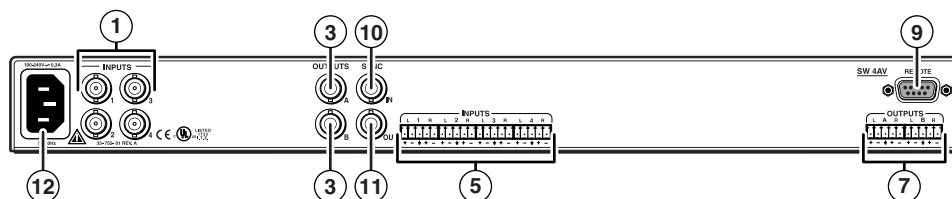
## Cabling and Rear Panel Views

All connectors are on the rear panel. The switcher can be connected to up to 12 S-video, composite video and/or stereo audio devices, depending on the model. All switcher models output two parallel video and/or audio outputs. S-video models encode one of the two video outputs as composite video. RCA audio models output one of the stereo audio outputs, unbalanced or balanced, on captive screw connectors and the other audio output, unbalanced, on RCA connectors.

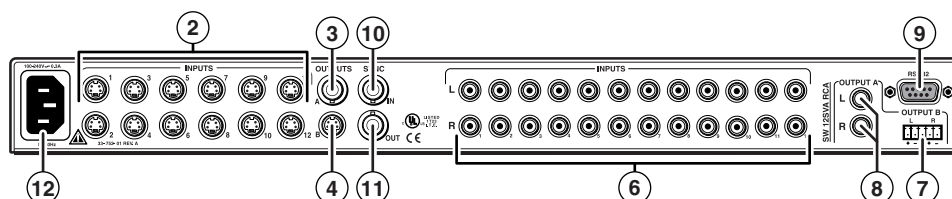
Figure 2-2 shows an SW 4AV composite video and audio switcher. Figure 2-3 shows an SW 12SVA RCA S-video and audio switcher. All of the switchers are housed in the same 1U enclosures, but have more or fewer input connectors to accommodate the different configurations they provide. The two switchers shown have all of the connector types that are available in the SW AV product family covered in this manual.

Some devices, such as VCRs, can be connected to both video input and audio input connectors of the switcher. Others, such as tape players or CD players, can be connected only to the audio input connectors. An audio device and a separate video device can share an input, although the switcher is capable of switching video and audio separately (audio breakaway).

## Installation, cont'd



**Figure 2-2 — SW 4AV composite video switcher with audio**



**Figure 2-3 — SW 12SVA RCA S-video switcher with audio on RCA connectors**

### Video input and output connections (video models only)

- ① **Composite video inputs (composite video (V) switchers only)** — For each input, connect a composite video source to one of these BNC connectors.
- ② **S-video inputs (S-video (SV) switchers only)** — For each input, connect an S-video source to one of these 4-pin mini DIN connectors.
- ③ **Composite video outputs (all video switcher models)** — Connect composite video displays or other devices to these BNC connectors for each composite video output.
- ④ **S-video output (S-video (SV) switchers only)** — Connect an S-video display or other device to this 4-pin mini DIN connector for the S-video output.

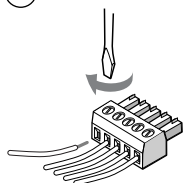
### Audio input and output connections (audio models only)

The audio level for each input can be individually set, via the front panel or RS-232, to ensure that the level on the output does not vary from input to input. See chapter 3, *Operation*, and chapter 4, *Remote Control* for details.

By default, the audio follows the video switch. Audio breakaway, which is commanded via the front panel (see chapter 3) or under RS-232 control via the SIS or Windows-based control program, allows you to select from any one of the audio input sources. See chapter 3, *Operation*, and chapter 4, *Remote Control* for details.

**CAUTION** *The captive screw connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio output circuits. Ensure that the captive screw connector is plugged into the desired input or output.*

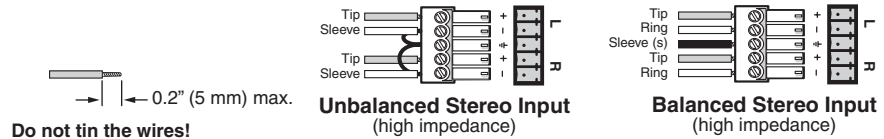
- ⑤ **Balanced or unbalanced audio input connections (captive screw connector audio (A) models only)** — Each input has a 3.5 mm, 5-pole captive screw connector for balanced or unbalanced stereo audio input. Connectors are included with each SW AV Series switcher, but you must supply the audio cable. See figure 2-4 to wire a connector for the appropriate input type and impedance level. High impedance is generally over 800 ohms.





**NOTE**

Figure 2-4 shows three methods of wiring the captive screw audio connectors for input and figure 2-5 shows two methods of wiring the connectors for output. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. If wiring a captive screw connector from an existing unbalanced audio cable, the white insulated wire is typically the left channel (tip) and the red insulated wire is typically the right channel (sleeve). There is no reliable standard for existing balanced audio cables.



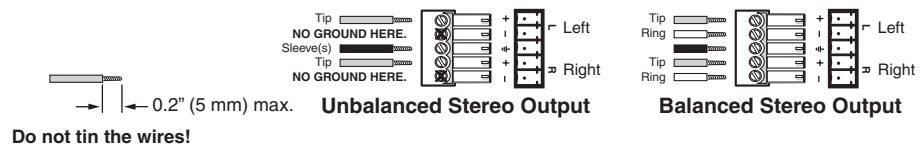
**Figure 2-4 — Captive screw connector wiring for audio inputs**

**NOTE**

The length of exposed wires is critical. The ideal length is 0.2" (5 mm).

- If the stripped section of wire is longer than 0.2", the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 0.2", wires can be easily pulled out even if tightly fastened by the captive screws.

- ⑥ **RCA connector audio inputs (RCA connector audio (A RCA) models only)** — Each input has a pair (left and right) of RCA connectors for unbalanced stereo audio input.
- ⑦ **Balanced or unbalanced audio output connectors (all audio models)** — These 3.5 mm, 5-pole captive screw connectors output the selected unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers to these connectors. See figure 2-5 to properly wire an output connector.



**Figure 2-5 — Captive screw connector wiring for audio output**

**CAUTION**

Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.

**NOTE**

The length of exposed wires is critical. The ideal length is 0.2" (5 mm).

- If the stripped section of wire is longer than 0.2", the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 0.2", wires can be easily pulled out even if tightly fastened by the captive screws.

## Installation, cont'd

- ⑧ **RCA connector audio output (RCA connector audio (A RCA) models only)** — The switcher has a pair (left and right) of RCA connectors for an unbalanced stereo audio output.

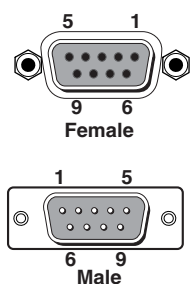
### Remote connection

- ⑨ **RS-232/Remote connector** — Connect a host device, such as a computer or touch panel control, or an IR remote control or a remote contact closure device (SW 4 and SW 6 models only) to the switcher via this 9-pin D connector (figure 2-6) for remote control of the switcher.

**NOTE** *The cable used to connect the RS-232/Remote port to a computer, control system, contact closure device, or IR control kit may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the switcher may hang up.*

**For RS-232 control and IR control**, use a control cable with only pins 2, 3, and 5 connected. Otherwise, either cut the wires to the other pins in hard-shelled connectors or remove the unneeded pins from molded plugs. See chapter 4, *Remote Control*, for definitions of the SIS commands and details on how to install and use the control software.

**For contact closure**, use a control cable with pins 2 and 3 **NOT** connected. Otherwise, either cut the wires to these pins in hard-shelled connectors or remove these pins from molded plugs. See chapter 4, *Remote Control*, for information on how to make a remote contact closure device.



Pin	RS-232	Contact closure	Function
1	—	In#1 *	Input #1 *
2	TX	—	Transmit data (-)
3	RX	—	Receive data (+)
4	—	In#2 *	Input #2 *
5	Gnd	Gnd	Signal ground
6	—	In#3 *	Input #3 *
7	—	In#4 *	Input #4 *
8	—	In#5 †	Input #5 †
9	—	In#6 †	Input #6 †

\* SW 4 and SW 6 models only  
† SW 6 models only

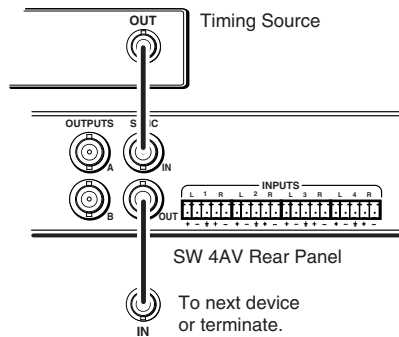
**Figure 2-6 — RS-232 or Remote port**

### External sync connection

When the switcher switches between inputs, the resulting change in image should be glitch-free, or clean. Video models of the SW AV Series switcher can use an external signal to synchronize switching during the vertical interval. Without the external sync locking feature, switching between inputs can result in a brief rolling (sync loss) or a brief change in the picture size.

- ⑩ **Sync In connector** — Connect an external genlock signal to this BNC connection for genlocking the video signal in broadcast or other sync-critical applications.
- ⑪ **Sync Out connector** — Connect any downstream equipment that requires genlocking to this BNC connector to route the external sync signal throughout the system in broadcast or other sync-critical applications.

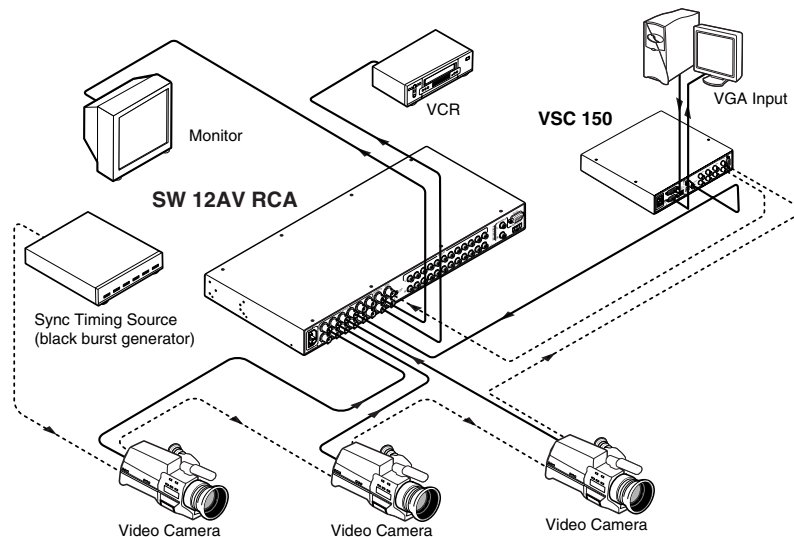
Figure 2-7 shows a basic external sync configuration. The Ext Sync In connector receives a timing signal. The Out connector allows the signal to be passed on to another video device, if required.



**Figure 2-7 — Simple external sync connection example**

Figure 2-8 shows another configuration, in which the timing source passes through three video cameras and a video scan converter before connecting to the switcher. This type of video camera is capable of synchronizing with the external timing source for video editing applications.

If no external sync timing source is connected to the switcher, switching occurs immediately after a front panel, RS-232, IR, or contact closure switch command.



**Figure 2-8 — Multiple device external sync connection example**

## Power connection

- ⑫ **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

## **Installation, cont'd**

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## **SW AV Series Switchers**

# Chapter Three

## **Operation**

Front Panel Controls and Indicators

Front Panel Operations

Optimizing the Audio (Audio Switchers)

Troubleshooting — If No Image Appears

# Operation

## Front Panel Controls and Indicators

The family of SW AV switchers have a wide variety of input buttons and other controls and LEDs that vary with the number of inputs and whether the switcher has video, audio, or both. Not all switchers have every control or indicator described in this chapter. The table at the bottom of this page identifies the control and indicator groups that are present on each switcher in the SW AV Series.

In the following descriptions, you will find the following terms:

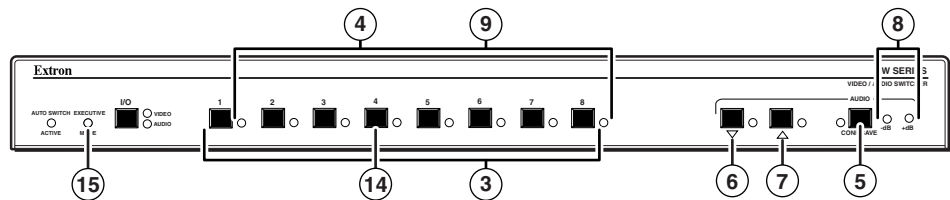
- **Video switcher** — Switches composite video or S-video. May or may not include audio switching.
- **Video-only switcher** — Switches composite video or S-video **only**. **No** audio switching.

Model	Part #	I/O A/V selection	Input Selection	Audio controls	Auto-switch mode	Executive mode
SW 4AV	60-484-21	Yes	Yes	Yes	Yes	Yes
SW 4AV RCA	60-484-31	Yes	Yes	Yes	Yes	Yes
SW 4SVA	60-484-22	Yes	Yes	Yes	Yes	Yes
SW 4SVA RCA	60-484-32	Yes	Yes	Yes	Yes	Yes
SW 6V	60-487-01	No	Yes	No	Yes	No
SW 6AV	60-487-21	Yes	Yes	Yes	Yes	Yes
SW 6AV RCA	60-487-31	Yes	Yes	Yes	Yes	Yes
SW 6SV	60-487-02	No	Yes	No	Yes	No
SW 6SVA	60-487-22	Yes	Yes	Yes	Yes	Yes
SW 6SVA RCA	60-487-32	Yes	Yes	Yes	Yes	Yes
SW 6A	60-487-20	No*	Yes	Yes	No	Yes
SW 6A RCA	60-487-30	No*	Yes	Yes	No	Yes
SW 8V	60-482-01	No	Yes	No	Yes	No
SW 8AV	60-482-21	Yes	Yes	Yes	Yes	Yes
SW 8AV RCA	60-482-31	Yes	Yes	Yes	Yes	Yes
SW 8SV	60-482-02	No	Yes	No	Yes	No
SW 8 SVA	60-482-22	Yes	Yes	Yes	Yes	Yes
SW 8SVA RCA	60-482-32	Yes	Yes	Yes	Yes	Yes
SW 8A	60-482-20	No*	Yes	Yes	No	Yes
SW 8A RCA	60-482-30	No*	Yes	Yes	No	Yes
SW 12V	60-483-01	No	Yes	No	Yes	No
SW 12AV	60-483-21	Yes	Yes	Yes	Yes	Yes
SW 12AV RCA	60-483-31	Yes	Yes	Yes	Yes	Yes
SW 12SV	60-483-02	No	Yes	No	Yes	No
SW 12SVA	60-483-22	Yes	Yes	Yes	Yes	Yes
SW 12SVA RCA	60-483-32	Yes	Yes	Yes	Yes	Yes
SW 12A	60-483-20	No*	Yes	Yes	No	Yes
SW 12A RCA	60-483-30	No*	Yes	Yes	No	Yes

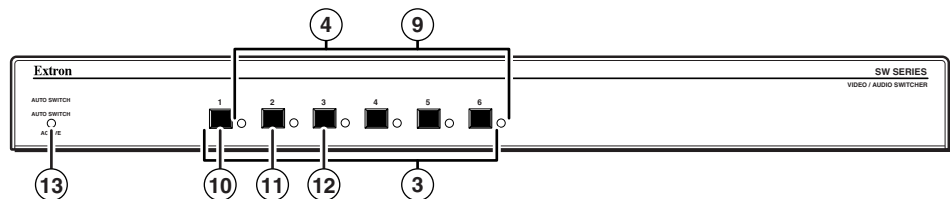
\* The control is present but not functional. The Audio LED is always lit and the Video LED is always unlit.

- **Audio switcher** — Switches audio on captive screw or RCA connectors. May or may not include video switching.
- **Audio-only switcher** — Switches audio **only** on captive screw or RCA connectors. **No** video switching.
- **Video AND audio switcher** — Switches both composite video or S-video AND audio on captive screw or RCA connectors.

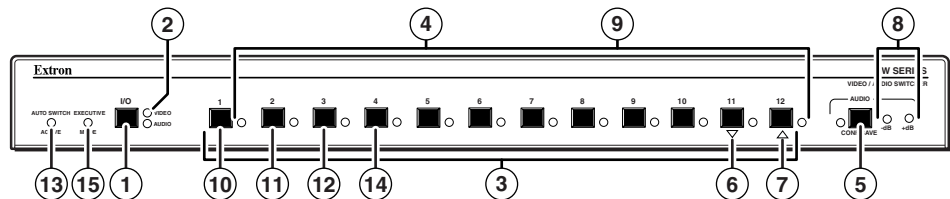
Figure 3-1 shows the front panel of an 8-input audio-only switcher. Figure 3-2 shows the front panel of a 6-input video-only switcher. Figure 3-3 shows the front panel of a 12-input video and audio switcher. These three examples show all of the combinations that you may encounter with your particular switcher. Many of the input buttons and LEDs on figure 3-1 through figure 3-3 have dual functions. Dual function controls have two callouts (Ⓝ numbers); each callout is related to its function in the following pages.



**Figure 3-1 — SW 8A front panel**



**Figure 3-2 — SW 6SV front panel**



**Figure 3-3 — SW 12VA RCA front panel**

### Audio/Video selection control and indicators (audio switchers)

- ① **I/O button** — The I/O button selects video, audio, or video and audio for input selection.

**NOTE** This button has no function on audio-only switchers.

- ② **Video and Audio LEDs** — The Video and Audio LEDs indicate whether video, audio, or video and audio will be selected using the Input buttons (③) and indicated by the Input LEDs (④).

**NOTE** The Audio LED is always lit on audio-only switchers.

Pressing the I/O button advances through a cycle of video and/or audio selection as follows: {default} video and audio, {press} video only, {press} audio only, {press} video and audio, and so on (figure 3-4).

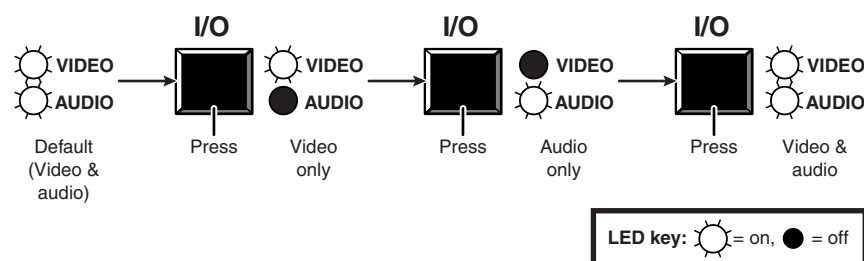


Figure 3-4 — Video and/or audio selection cycle

### Input selection controls and indicators

- ③ **Input 1 through 4, 6, 8, or 12 buttons** — Each Input button selects the associated input for output. A more detailed explanation of the input selection function is included in *Front panel operations*, beginning on page 3-6.

On video switchers, the Input 1, Input 2, and Input 3 buttons are also used to toggle autoswitch mode on and off. See *Autoswitch mode controls and indicator (video switchers)* on page 3-5 and items ⑩, ⑪, and ⑫.

On audio models, the Input 1 and Input 4 buttons are also used to toggle executive mode on and off. See *Autoswitch mode controls and indicator (audio switcher)* on page 3-5 and items ⑩ and ⑭.

On 12-input audio switchers, the Input 11 and Input 12 buttons are also used to decrease and increase the amount of audio gain for a selected input. See *Audio controls and indicator (audio switcher)* on page 3-5 and items ⑥ and ⑦.

- ④ **Input 1 through 4, 6, 8, or 12 LEDs** — The input LEDs identify the selected input.

On models that switch both video **and** audio, if audio is broken away, the selected video input is indicated by a steadily lit input LED and the selected audio input is indicated by a blinking input LED.

On audio switchers, the input LEDs also indicate the audio level (attenuation (-dB) or gain (+dB)) of the selected input. See *Audio controls and indicators (audio switchers)* on page 3-5.



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## Audio controls and indicators (audio switchers)

Audio switchers have audio gain and attenuation adjustments.

- ⑤ **Audio configuration/save button and LED** — The Audio button and LED enable the user to view and/or change the current audio level setting for each input. See *Adjusting audio gain and attenuation (audio switchers)* in this chapter.
- ⑥ **Down (▼) button and LED** — The ▼ button is used to decrease the audio level for a selected input. Press and release the button to decrease the audio level or press and hold the button to decrease the audio level at a rate of 3 dB per second until the button is released.  
  
The LED flashes to indicate each 1 dB decrease in the audio level. See *Adjusting audio gain and attenuation (audio switchers)* in this chapter.  
  
On 12-input audio switchers, this button and LED are secondary functions of the Input 11 button and LED.
- ⑦ **Up (▲) button and LED** — The ▲ button is used to increase the audio level for a selected input. Press and release the button to increase the audio level or press and hold the button to increase the audio level at a rate of 3 dB per second until the button is released.  
  
The LED flashes to indicate each 1 dB increase in the audio level. See *Adjusting audio gain and attenuation (audio switchers)* in this chapter.  
  
On 12-input audio switchers, this button and LED are secondary functions of the Input 12 button and LED.
- ⑧ **-dB/+dB LEDs** — The -dB and +dB LEDs indicate the polarity of the audio level setting. See *Adjusting audio gain and attenuation (audio switchers)* in this chapter.
- ⑨ **Audio level indicators** — The Input 1 through Input 4 LEDs each indicate a range of 6 dB when lit (Input 1 LED: off = 0 dB to 5 dB, Input 1 LED: lit = 6 dB to 11 dB, Input 1 and 2 LED: lit = 12 dB to 17 dB, and so on). See *Adjusting audio gain and attenuation (audio switchers)* in this chapter.

## Autoswitch mode controls and indicator (video switchers)

Video switchers support autoswitch mode. When autoswitch mode is enabled, the switcher continuously monitors all inputs and automatically switches to the highest-numbered input with video sync pulses present. If video is absent from all inputs, input 1 is selected.

- ⑩ **Mode button** — The Mode button is used with the Normal button or the Auto button to select the switching mode. See *Switch mode* in this chapter.  
  
This button is a secondary function of the Input 1 button.
- ⑪ **Normal button** — The Normal button is used with the Mode button to select normal mode. See *Switch mode* in this chapter.  
  
This button is a secondary function of the Input 2 button.

### NOTE

When you change from autoswitch to normal (manual) mode, the last input selected in autoswitch mode remains selected until you manually select a different input.

- ⑫ **Auto(switch) button** — The Auto button is used with the Mode button to select autoswitching mode. See *Switch mode* in this chapter.

This button is a secondary function of the Input 3 button.

- ⑬ **Auto Switch Active LED** — When lit, the Auto Switch Active LED indicates that the switcher is in autoswitch mode. When unlit, the switch is in normal (manual) mode. See *Switch mode* in this chapter.

**NOTE** This LED will never light on audio-only switchers.

### Executive mode controls and indicator

Audio switchers have audio gain and attenuation adjustments. In executive mode, front panel adjustment of the audio level is locked. The level cannot be adjusted from the front panel until the panel is unlocked. See *Executive mode* in this chapter.

Audio gain and attenuation adjustments are still available via the RS-232 link when the switcher is in executive mode.

- ⑩ **Mode button** — The Mode button is used with the Executive mode button to toggle executive mode on and off. See *Executive mode (front panel security lockout)* in this chapter.

This button is a secondary function of the Input 1 button.

- ⑭ **Executive Mode button (unlabeled)** — The Executive mode button is an unlabeled secondary function of the Input 4 button. Executive mode is used with the Mode button to toggle executive mode on and off. See *Executive mode (front panel security lockout)* in this chapter.

- ⑮ **Executive Mode LED** — The Executive Mode LED indicates that the switcher is in executive mode, and that the front panel I/O button and all audio gain and attenuation adjustments are locked.

## Front Panel Operations

The following paragraphs detail the power up process and provide sample procedures for switching inputs, viewing and adjusting the audio level, changing between normal and autoswitch mode, and toggling executive mode on and off.

### Power

Plug in the switcher. On all switcher models, power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks the front panel LEDs during the test. An error-free power up self-test sequence leaves the Auto Switch Active, Executive Mode, Video, Audio, and Input LEDs on or off in the same configuration as they were when power was last removed.

If an error occurs during the self-test, the switcher locks up and will not operate. If your switcher locks up on power-up, call the Extron S<sup>3</sup> Sales & Technical Support Hotline.

Plug in all system components and turn on the input devices (such as DVD players, laserdisc players, VCRs, and DSS receivers) and the output devices. Set the input devices to output video using each device's own operating instructions. Select an input. The image should appear on the screen. If no image appears, see *Troubleshooting — If No Image Appears*, in this chapter.

### Switching inputs

An input can be selected for output using the front panel buttons. In switchers with both video **and** audio, the audio input can switch with the video input (audio follow) or either can be switched separately (audio breakaway). Select an input as follows:

1. **(Video AND audio switchers)** Select to switch video, audio, or both by pressing the I/O button.
2. Select the desired input by pressing the associated input button.
3. Observe that the LED for the selected input lights or blinks (audio breakaway **(Video AND audio switchers)**).

- NOTE**
1. *Video (autoswitching) models must be in normal (manual) mode.*
  2. **(Video AND audio switchers)** *If, after you have selected video and audio by pressing the I/O button, the Audio LED blinks and the Video LED is on, the LED s indicate audio breakaway; the selected audio input is not the same as the video input.*

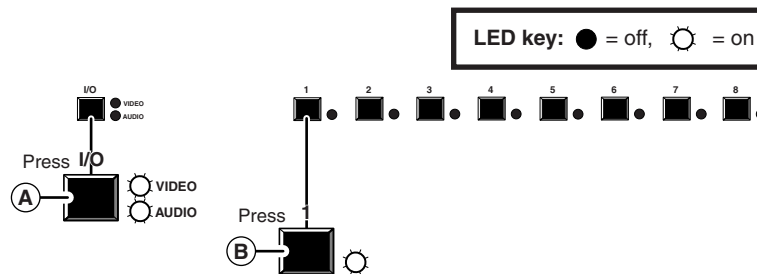
An input can also be selected using an RS-232 device or a third party contact closure device (4-input and 6-input models only). See chapter 4, *Remote Control*.

### Example 1: Select an input

See figure 3-5 and the following steps for an example in which the input 1 video and audio is selected for output.

- NOTE** *Video switchers must be in normal (manual) mode.*

- (A)** **(Video AND audio switchers)** To select video and audio to switch, if necessary, press and release the I/O button until the Video and Audio LEDs light.

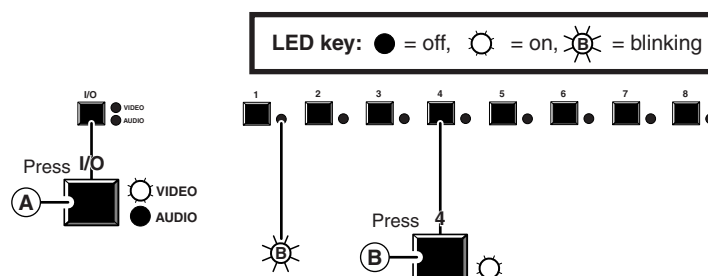


**Figure 3-5 — Example 1: Selecting video and audio input 1**

- (B)** Press and release the input 1 button. The input 1 LED lights. The video and audio on input 1 are now selected for output.

### Example 2: Select a video input only (video AND audio switcher)

See figure 3-6 and the following steps for an example in which the input 4 video only is selected for output (audio breakaway).



**Figure 3-6 — Example 2: Selecting video input 4**



number of 1 dB steps you increment or decrement the audio level (see step 4), you can determine the exact gain or attenuation setting.

The +dB LED on indicates a positive (gain) level. The -dB LED on indicates a negative (attenuation) level. Both LEDs on indicate 0 dB.

4. Press and release the ▼ and ▲ buttons to increase and decrease the audio level by 1 dB or press and **hold** the buttons to increase or decrease the level by 3 dB per second. The ▼ and ▲ LEDs flash to indicate each 1 dB level change.

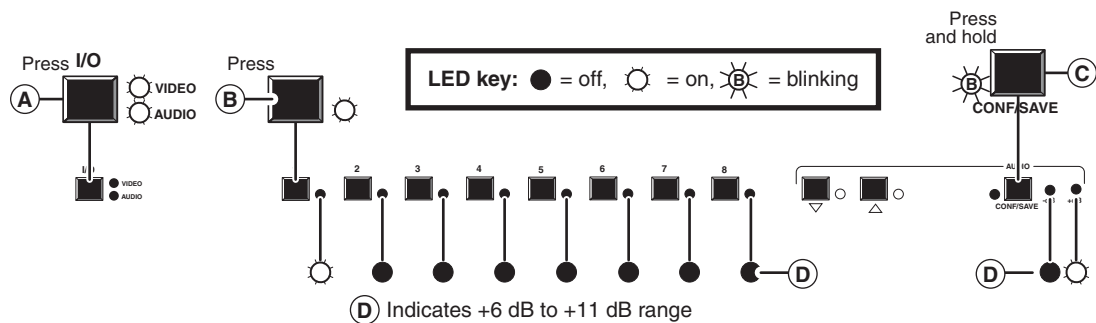
**NOTE** Each time you press and release the ▼ or ▲ button, wait for the ▼ or ▲ LED to flash before pushing the button again. Pressing the button early may not increment or decrement the audio level.

5. Press and hold the Audio Conf/Save button until the Audio Conf/Save LED turns off to save the gain value in memory and exit the audio display and adjustment mode.

- NOTE**
1. There is one audio level setting per input. The setting is shared by the left and right audio inputs.
  2. The audio level settings are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.

#### Example 4: Adjust the audio level

See figure 3-8 and figure 3-9 (on page 3-10) for an example in which the audio level is adjusted.



**Figure 3-8 — Example 4: Viewing the audio level**

- (A) (Video AND audio switchers) Press and release the I/O button as necessary to select audio (or audio and video). The audio LED lights in either case.
- (B) Press and release an input button to select an input. The associated input LED lights.
- (C) Press and **hold** the Audio Conf/Save button until the Audio Conf/Save LED starts blinking.
- (D) The gain or attenuation value is displayed in the input 1 through 4 LEDs. In figure 3-8, the LED readout shows a range of +6 dB to +11 dB.

## Operation, cont'd

If the +dB and -dB LED are both lit they indicate 0 dB. Otherwise, you can determine the exact gain or attenuation using the following procedure.

1. If one or more input LEDs are lit AND the +dB LED is lit, press and release the ▼ button repeatedly until the highest-numbered lit input LED goes out. Count the button presses. **In Example 4**, assume a value of +8 dB. It will take three presses of the ▼ button for the Input 1 LED to go out.

If one or more input LEDs are lit AND the -dB LED is lit, press and release the ▲ button repeatedly until the highest-numbered lit input LED goes out. Count the button presses.

If the +dB LED is lit and NO input LEDs are lit, press and release the ▼ button repeatedly until the +dB and -dB LED are both lit, indicating 0 dB. Count the button presses.

If the -dB LED is lit and NO input LEDs are lit, press and release the ▲ button repeatedly until the +dB and -dB LED are both lit, indicating 0 dB. Count the button presses.

2. Return to the original audio level setting by pressing and releasing the ▼ or ▲ button (the opposite of the button you pushed in step 1) the same number of steps you pushed the opposite arrow button in step 1. **In Example 4**, this means pushing the ▲ button three times.

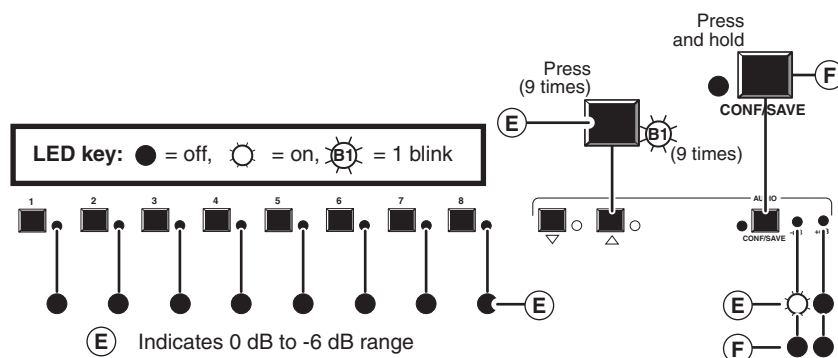
3. Add the dB value indicated by the highest-numbered lit input LED (no input LEDs lit = 0 dB) and either:

The number of button presses from 0 dB or,

The number of button presses from when the highest-numbered input LED lit. **In Example 4**, Input 1 LED (6 dB) + 2 presses (2 dB) = 8 dB.

4. The lit +dB or -dB LED indicates the gain (+) or attenuation (-).

- (E) Press and release the ▼ button several times to decrease the audio level displayed in the input LEDs by 1 dB per button push. The ▼ LED flashes each time the button is pressed. Note the input LED, +dB LED, and -dB LED changes that occur each time the ▼ button is pressed and released. Figure 3-9 shows the result of pressing the ▼ button a total of nine times to change the value to -1 dB. Note that the +dB LED has turned off and that the -dB LED is on to indicate a negative level.



**Figure 3-9 — Example 4, step E: Adjusting the audio level**

- (F) Press and **hold** the Audio Conf/Save button until the Audio LED goes off. The input LEDs stop displaying the audio level range, the +dB and -dB LEDs go off, and the selected input LED lights.

---

### Audio level reset — single input

To reset the audio level for an input to 0 dB, select the input:

**NOTE** *Video switchers must be in normal mode.*

1. **(Video AND audio switcher)** Select to switch both video and audio or audio only by pressing the I/O button.
2. Press and release an input button to select an input.
3. Press and **hold** the Audio Conf/Save button until the Conf/Save LED begins to blink. Release the button.
4. Press and release the ▼ and ▲ buttons simultaneously.
5. Press and hold the Audio Conf/Save button again until the Conf/Save LED turns off to save the reset level in memory and exit the audio display and adjustment mode.

### Audio level reset — all inputs

Reset the audio level to 0 dB for all inputs as follows:

1. Press and **hold** the Audio Conf/Save button for approximately 10 seconds until all Input LEDs light for approximately 1 second and then turn off. Release the Conf/Save button.
2. Press and **hold** the Audio Conf/Save button again until the Conf/Save LED turns off to save the reset level in memory and exit the audio display and adjustment mode.

### Switch mode

Video switchers support autoswitch mode. In autoswitch mode, the switcher automatically switches to the highest-numbered input with video sync signals present. Input selection, by the front panel buttons or the RS-232/Remote port, is blocked while in autoswitch mode. However, the front panel LEDs remain functional and the Input 1 through Input 3 buttons can be used to view or change the mode.

**NOTE** *The switcher must be in normal (manual) mode for contact closure to work. Audio breakaway is disabled in autoswitch mode; audio always follows video. When you change from autoswitch to normal (manual) mode, the last input selected in autoswitch mode remains selected until you manually select a different input.*

Turn autoswitch mode on as follows:

1. Press and **hold** the Mode (Input 1) button.
2. Press and release the Auto (Input 3) button. The Auto Switch Active LED lights.
3. Release the Mode button.

Turn autoswitch mode off as follows:

1. Press and **hold** the Mode (Input 1) button.
2. Press and release the Normal (Input 2) button. The Auto Switch Active LED goes off.
3. Release the Mode button.



### Executive mode (front panel security lockout)

Audio switchers have an executive mode that limits the operation of the SW AV switcher from the front panel. When the switcher is in executive mode, the I/O button (video/audio/video and audio selection), toggling between autoswitch and normal mode, and all of the front panel audio gain and attenuation functions are disabled.

Toggle executive mode on and off as follows:

1. Press and **hold** the Mode (Input 1) button.
2. Press and release the Input 4 button. The Executive Mode LED changes state.  
  
If executive mode was off, the LED turns on to indicate that the switcher has entered executive mode.  
  
If executive mode was on, the LED turns off to indicate that the switcher has left executive mode.
3. Release the Mode button.

### Memory

Audio and mode settings are saved in nonvolatile memory. When the switcher is powered off, the settings are retained. When the switcher is powered on, the saved memory settings are active. The selected input is not a saved value; when the switcher is powered on it, defaults to input 1.

**NOTE** *If a video switcher is powered off in auto mode, it automatically switches to the highest-numbered input with video sync pulses present when it is powered back on. If no input has video present, all input select LEDs are off (only the Power LED is on, if equipped).*

### Optimizing the Audio (Audio Switchers)

Each individual input audio level can be adjusted within a range of -18 dB to +24 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio outputs to output devices such as audio players. See *Audio input and output connections (audio models only)*, in chapter 2, *Installation*. For best results, wire all of the inputs and the outputs unbalanced.
2. Power on the audio sources, the switcher, and the audio players.
3. Switch among the inputs (see *Switching inputs*, in this chapter), listening to the audio with a critical ear or measuring the output audio level with test equipment, such as a VU meter.
4. As necessary, adjust the audio level of each input (see *Adjusting audio gain and attenuation (audio switchers)*, in this chapter) so that the approximate output level is the same for all selected inputs.



---

## **Troubleshooting — If no Image Appears**

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the input LEDs is lit.
2. Ensure an active input is selected on the switcher or that the switcher is in autoswitch mode.
3. Ensure that the proper signal format is supplied.
4. Check the cabling and make corrections as necessary.
5. Call the Extron S<sup>3</sup> Sales & Technical Support Hotline if necessary.

## **Operation, cont'd**

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## SW AV Series Switchers

# 4

## Chapter Four

### Remote Control

Simple Instruction Set Control

Windows-Based Program Control

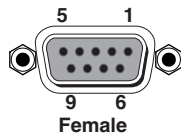
Contact Closure Control (SW4 and SW6 Models Only)

Infrared Remote Control (SW4 and SW6 Models Only)

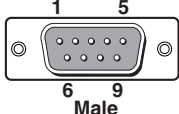
# Remote Control

The SW AV Series switchers can be remotely controlled via the switcher's rear panel Remote (SW 4 and SW 6 models) or RS-232 (SW 8 or SW 12 models) connector (Figure 4-1). Remote control devices can be:

- A host device such as a computer or third-party control system
- A device such as an Extron IR 102 Universal remote control kit
- A contact closure device such as an Extron KP 6 Keypad Control



Female



Male

Pin	RS-232	Contact closure	Function
1	—	In#1 *	Input #1 *
2	TX	—	Transmit data (-)
3	RX	—	Receive data (+)
4	—	In#2 *	Input #2 *
5	Gnd	Gnd	Signal ground
6	—	In#3 *	Input #3 *
7	—	In#4 *	Input #4 *
8	—	In#5 †	Input #5 †
9	—	In#6 †	Input #6 †

\* SW 4 and SW 6 models only

† SW 6 models only

**Figure 4-1 — Remote connector pinout**

Two or three remote control methods are available:

- Extron's Simple Instruction Set
- Extron's Windows-based control program
- **SWS 4 and SW 6 models only**, contact closure

**NOTE** The cable used to connect the RS-232/Remote port to a computer, control system, contact closure device, or IR control kit may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the switcher may hang up.

**For RS-232 control and IR control**, use a control cable with only pins 2, 3, and 5 connected. Otherwise, either cut the wires to the other pins in hard-shelled connectors or remove the unneeded pins from molded plugs. See chapter 4, *Remote Control*, for definitions of the SIS commands and details on how to install and use the control software.

**For contact closure**, use a control cable with pins 2 and 3 **not** connected. Otherwise, either cut the wires to these pins in hard-shelled connectors or remove these pins from molded plugs. See chapter 4, *Remote Control*, for information on how to make a remote contact closure device.

## Simple Instruction Set Control

### Host-to-switcher communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

## Switcher-initiated messages

When a local event occurs, such as a front panel operation, loss or restoration of an input signal, or an error condition, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

(C) Copyright 2002, Extron Electronics, SW AV Series, Vx.xx ↵

Cn ↵

The switcher issues the copyright message and input selected message when it first powers on. Vx.xx is the firmware version number. Cn identifies the currently selected input, where n is the input number (input 1 is the power-up default in normal mode). The switcher also sends the Cn ↵ message whenever the selected input is changed using the front panel buttons.

Sig n n n n n n ↵

A video switcher initiates this message when there is a change in the status of a video input. Each n indicates an input (1 through last, from left to right). n = 1 indicates video signal present, n = 0 indicates video signal not preset. There are as many ns in the switcher-initiated message as the maximum number of inputs for the models (4, 6, 8, or 12).

Reconfig ↵

The switcher initiates the Reconfig message when there is a change in an audio model's audio gain setting.

## Error responses

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the switcher is unable to execute the command because the command is invalid or it contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 ↵ – Invalid input channel number (out of range)

E10 ↵ – Invalid command

E13 ↵ – Invalid parameter (out of range)

E14 ↵ – Illegal command for this configuration

## Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

## Using the command/response table

The command/response table is on the next page. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table at right is for use with the command/response table.

ASCII to HEX Conversion Table																Esc 1B	CR 0D	LF 0A
Space 20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27	(	28	)	29
*	2A	+	2B	,	2C	-	2D	.	2E	/	2F	0	30	1	31	2	32	3
33	4	34	5	35	6	36	7	37	8	38	9	39	:	3A	;	3B	<	3C
=	3D	>	3E	?	3F	@	40	A	41	B	42	C	43	D	44	E	45	F
46	G	47	H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57	X	58	Y
59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F	`	60	a	61	b	62
c	63	d	64	e	65	f	66	g	67	h	68	i	69	j	6A	k	6B	l
6C	m	6D	n	6E	o	6F	p	70	q	71	r	72	s	73	t	74	u	75
v	76	w	77	x	78	y	79	z	7A	{	7B		7C	}	7D	~	7E	DEL 7F

## Remote Control, cont'd

**NOTE** With the exception of the audio gain and attenuation commands, the SIS commands are **not** case sensitive.

### Symbol definitions

**NOTE** Input and output numbers in commands may be entered as either 1-, 2-, or 3-digit numbers. All input and output numbers are specified as 3-digit numbers in the response.

↵	=	CR/LF (carriage return/line feed) (0x0D 0A)
←	=	CR (carriage return, no line feed)
•	=	space
[X1]	=	Input number 0 through the maximum number of inputs (0 = muted output)
[X2]	=	Input number 1 through the maximum number of inputs
[X3]	=	Input signal status 0 = no signal detected, 1 = signal detected
[X4]	=	Off/On status 0 = off, 1 = on
[X5]	=	Gain/attenuation -18 dB to +24 dB, each step = 1 dB
[X6]	=	Gain value Numeric dB value, 0 to 24
[X7]	=	Attenuation value Numeric dB value, 1 to 18
[X8]	=	Front panel switch mode 1 = normal (manual mode, 2 = autoswitch mode)
[X9]	=	Controller firmware x.xx

### Command/Response Table for SIS Commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
<b>Input selection</b>			
Select video and/or audio input	[X1]!	In[X1]•All ↵	Select input [X1] entire channel.
Example (SW 4AV):	3!	In003•All	Select input 3 video and audio.
Example (SW 6SV):	5!	In005•All	Select input 5 video only.
Example (SW 12A RCA):	10!	In010•All	Select input 10 audio only.
Select video input only	[X1]&	In[X1]•Vid ↵	Select input [X1] video only (audio breakaway).
Select audio input only	[X1]\$	In[X1]•Aud ↵	Select input [X1] audio only (audio breakaway).
<b>Input video sensing</b>			
Request all inputs' status	0S	Sig•[X3] <sup>1</sup> •[X3] <sup>2</sup> •...•[X3] <sup>n</sup> ↵	Each [X3] response is the signal status of an input, starting from input 1; n is the maximum number of inputs for this model.
Example (SW 6V):	0S	Sig•1•1•1•0•1•0 ↵	The input signal is present on inputs 1, 2, 3, and 5. No signal is present on inputs 4 and 6.
Request an individual input's status	[X2]S	[X3] ↵	[X2]'s signal status = [X3].
<b>Video mute</b>			
Mute video	1B	Vmt1 ↵	Output no video signal.
Unmute video	0B	Vmt0 ↵	Output selected video input.
Read video mute	B	[X4] ↵	Mute status = [X4].

## Command/Response Table for SIS Commands (Continued)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
<b>Audio mute</b>			
Mute audio	1Z	Amt1 ␣	Output no audio signal.
Unmute audio	0Z	Amt0 ␣	Output selected audio input.
Read audio mute	Z	[X4] ␣	Mute status = [X4].
<b>Audio gain and attenuation</b>			
Set gain	[X2]*[X6]G	In[X2]•Aud[X5] ␣	Set gain for input [X2] to [X6] dB.
Example:	4*3G	In004•Aud+03 ␣	Set gain for input 4 to 3 dB.
Set attenuation	[X2]*[X7]g	In[X2]•Aud[X5] ␣	Set attenuation for input [X2] to [X7] dB.
Increment level (specified input)	[X2]+G	In[X2]•Aud[X5] ␣	Increase input [X2] audio level by +1 dB.
Decrement level (specified input)	[X2]-G	In[X2]•Aud[X5] ␣	Decrease input [X2] audio level by -1 dB.
View audio level (specified input)	V[X2]G	[X5] ␣	View gain for input [X2].
Example:	V4G	In004•Aud=-03 ␣	Attenuation for input 4 is set to -3 dB.
Set gain (current input)	[X6]G	In[X2]•Aud[X6] ␣	Set gain for the current input to [X6] dB.
Set attenuation (current input)	[X7]g	In[X2]•Aud[X7] ␣	Set attenuation for the current input [X7] dB.
Increment level (current input)	+G	In[X2]•Aud[X5] ␣	Increase input [X2] audio level by +1 dB.
Decrement level (current input)	-G	In[X2]•Aud[X5] ␣	Decrease input [X2] audio level by -1 dB.
View audio level (current input)	G	[X5] ␣	View gain for input [X2].
Example:	G	-03 ␣	Attenuation for input 4 is set to -3 dB.
<b>Front panel security lockout (executive mode)</b>			
Lock front panel	1X	Exe1 ␣	Output no video signal.
Unlock front panel	0X	Exe0 ␣	Output selected video input.
Read lock status	X	[X4] ␣	Lock status = [X4]
<b>Front panel mode</b>			
Set normal switch mode	1#	F1 ␣	Set switch mode to normal.
Set auto switch mode	2#	F2 ␣	Set switch mode to auto.
<b>Resets</b>			
Reset all audio levels to 0 dB	[Esc]ZA ␣	Zpa ␣	
System reset	[Esc] ZXXX ␣	Zpx ␣	Reset to factory defaults
<b>View, information, part number, and firmware requests</b>			
Information request	I	V*[X1]•A*[X1]•F*[X8]Vmt[X4]•Amt[X4] ␣	
Example:	I	V*004•A*004•F*1Vmt0•Amt0 ␣	Video input 4; audio input 4; manual switch mode; video mute off; audio mute off.
Request for part number	N	nn-nnn-nn ␣	
Example:	N	60-484-22	60-484-22 = SW 4SVA.
Query software version	Q	[X9] ␣	
Example:	Q	1.23	Sample value only.

### Windows-Based Program Control

The Universal Switcher Control Program, part #29-031-01, is compatible with Windows 3.1, 3.11, 95/98, and above, and provides remote control of the following:

- Input selection (including audio breakaway for models with video and audio)
- Audio gain and attenuation adjustments (audio models)
- Front panel switch mode selection (autoswitching models)

Updates to this program can be downloaded from the Extron Web site (<http://www.extron.com>).

### Installing the software

The program is contained on two 3.5" diskette and must be installed and run from the hard drive.

To install the software on the hard drive, run setup.exe from floppy disk #1 and follow the screen instructions.

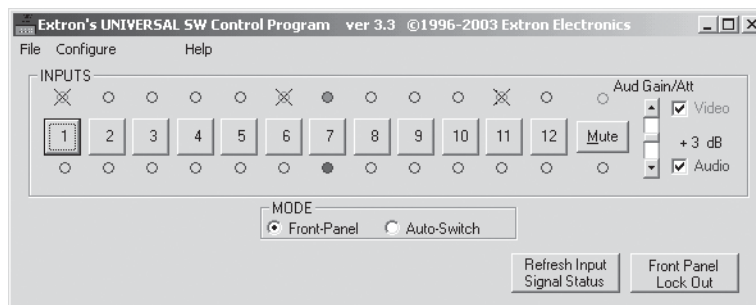
By default, the Windows installation creates a C:\UNIVSW folder and places two icons (Universal Switcher Control Program and Universal Switcher Help) into a group named "Extron Electronics".

### Using the software

1. To run the software, double click on the Universal Switcher Control Program icon in the Extron Electronics program group.



2. Click on the comm port that is connected to the switcher's RS-232 port.
3. The Extron Universal Switcher Control Program window (Figure 4-2) displays the selected input, the audio gain for the selected input, and the panel mode.



**Figure 4-2 — Universal Switcher program window**

● indicates that the input signal is present and is selected.

○ indicates that the input signal is present but not selected.

⊗ indicates that the input signal is not present.


Push the  button to refresh the input signal status.



---

## Using the help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program group, double-click on the Signal Enhancement Products Help icon.  

- From within the Windows-based switcher control program, click on the Help entry on the task bar.
- From within the Windows-based switcher control program, press the F1 key.

## Contact Closure Control (SW 4 and SW 6 Models Only)

The Remote connector also provides a way to select an input to the switcher using a remote contact closure device, such as an Extron KP 6 Keypad Remote Control or a locally-built device. Contact closure control uses pins on the Remote connector that are not used by the RS-232 interface. The contact closure pin assignments are shown in the table on page 4-2.

**NOTE** *Autoswitching models (models with video) must be in normal (manual) mode.*

To select a different input number using a contact closure device, momentarily short the pin for the desired input number to logic ground (pin 5). To force one of the inputs to be always selected, leave the short to logic ground in place. The short overrides front panel input selections.

## Infrared Remote Control

The optional Extron IR 102 Remote Control Kit consists of the following components:

- IR 102 switcher remote (hand-held remote control)
- IR detector with 6' cable
- IR 102 Rx receiver box with 3' cable
- External 12 VDC adapter power supply

Install and operate the remote control in accordance with *IR 102 User's Guide* (part #68-663-01) included with the remote.

## **Remote Control, cont'd**

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## SW AV Series Switchers

# Appendix A

## Specifications and Part Numbers

Specifications

Part Numbers

# Specifications

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## Video

Gain .....	Unity
Bandwidth	
Composite video 4, 6, and 8 input models	300 MHz (-3 dB)
S-video models and composite video 12 input models	250 MHz (-3 dB)
Differential phase error .....	<1.0° at 3.58 MHz and 4.43 MHz
Differential gain error .....	<1.0% at 3.58 MHz and 4.43 MHz
Crosstalk .....	<-60 dB @ 5 MHz
Switching speed .....	<20 ms (max.)

## Video input

Number/signal type	
SW 6/8/12V, SW 4/6/8/12AV/AV RCA, SW 6/8/12A/A RCA	4, 6, 8, or 12 (depending on the model) composite video
SW 6/8/12 SV, SW 4/6/8/12SVA/SVA RCA	4, 6, 8, or 12 (depending on the model) S-video
Connectors	
SW 6/8/12V, SW 4/6/8/12AV/AV RCA, SW 6/8/12A/A RCA	4, 6, 8, or 12 (depending on the model) BNC female
SW 6/8/12 SV, SW 4/6/8/12SVA/SVA RCA	4, 6, 8, or 12 (depending on the model) 4-pin mini DIN female
Nominal level .....	1 Vp-p for Y of S-video, and for composite video 0.3 Vp-p for C of S-video
Minimum/maximum levels .....	0.4 V to 2.0 Vp-p with no offset
Impedance .....	75 ohms
Return loss .....	<-40 dB @ 0 to 10 MHz
DC offset (max. allowable) .....	5.0 V

## Video output

Number/signal type	
Composite video models .	2 buffered composite video
S-video models .....	1 buffered S-video, 1 buffered composite video
Connectors	
Composite video models .	2 BNC female
S-video models .....	1 BNC female, (1) 4-pin mini DIN
Nominal level .....	1 Vp-p for Y of S-video, and for composite video 0.3 Vp-p for C of S-video
Minimum/maximum levels .....	0.4 V to 2.0 Vp-p (follows input)
Impedance .....	75 ohms
Return loss .....	<-30 dB @ 5 MHz
DC offset .....	±5 mV with input at 0 offset
Switching type .....	Vertical interval switching

## Sync

Genlock connectors .....	2 BNC female (1 input, 1 loop-through)
Standards .....	NTSC 3.58, NTSC 4.43, PAL, SECAM

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## Audio

Gain .....	Adjustable When gain is set to unity (0 dB), balanced output from captive screw connectors or unbalanced output from RCA connectors will have a 0 dB gain; unbalanced output from captive screw connectors will be attenuated by 6 dB.
Frequency response .....	20 Hz to 20 kHz, $\pm 0.5$ dB
THD + Noise .....	<0.04% @ 1 kHz at nominal level
S/N .....	>90 dB at maximum output (unweighted)

## Audio input

Number/signal type	SW 6/8/12V, SW 4/6/8/12AV, SW 6/8/12 SV, SW 4/6/8/12SVA, SW 6/8/12A 4, 6, 8, or 12 (depending on the model) stereo, balanced/unbalanced SW 4/6/8/12AV RCA, SW 4/6/8/12SVA RCA, SW 6/8/12A RCA 4, 6, 8, or 12 (depending on the model) stereo, unbalanced
Connectors	SW 6/8/12V, SW 4/6/8/12AV, SW 6/8/12 SV, SW 4/6/8/12SVA, SW 6/8/12A 4, 6, 8, or 12 (depending on the model) 3.5 mm captive screw connectors, 5 pole SW 4/6/8/12AV RCA, SW 4/6/8/12SVA RCA, SW 6/8/12A RCA 8, 12, 16, or 24 (depending on the model) RCA female
Impedance .....	>25k ohms unbalanced, 50k ohms balanced, AC/DC coupled
Nominal level .....	+4 dBu (1.23 Vrms), 0 dBu (0.775 Vrms), -10 dBV (316 mVrms), -20 dBV (100 mVrms), configurable
Maximum level .....	>+15 dBu, (balanced or unbalanced) at 1% THD+N
Input gain adjustment .....	-18 dB to +24 dB, adjustable per input

**NOTE** 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV  $\approx$  2 dBu.

## Audio output

Number/signal type	SW 6/8/12V, SW 4/6/8/12AV, SW 6/8/12 SV, SW 4/6/8/12SVA, SW 6/8/12A 2 stereo, balanced/unbalanced SW 4/6/8/12AV RCA, SW 4/6/8/12SVA RCA, SW 6/8/12A RCA 1 stereo, unbalanced 1 stereo, balanced/unbalanced
Connectors	SW 6/8/12V, SW 4/6/8/12AV, SW 6/8/12 SV, SW 4/6/8/12SVA, SW 6/8/12A (2) 3.5 mm captive screw connectors, 5 pole SW 4/6/8/12AV RCA, SW 4/6/8/12SVA RCA, SW 6/8/12A RCA 2 RCA female (1) 3.5 mm captive screw connector, 5 pole
Impedance .....	50 ohms unbalanced, 100 ohms balanced
Gain error .....	$\pm 0.1$ dB channel to channel
Nominal level .....	+4 dBu (1.23 Vrms), 0 dBu (0.775 Vrms), -10 dBV (316 mVrms), -20 dBV (100 mVrms), configurable
Maximum level (Hi-Z) .....	>26 dBu, balanced; >+20 dBu, unbalanced at 1% THD+N
Maximum level (600 ohm) .....	>21 dBm, balanced; >+15 dBm, unbalanced at 1% THD+N

## Specifications, cont'd

### Control/remote — switcher

Serial control port .....	RS-232, 9-pin female D connector (also used for contact closure for 4- and 6-input models)
Baud rate and protocol .....	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Contact closure (SW 4/6 ____)	(1) 9-pin female D connector (also used for RS-232)
Contact closure pin configurations (SW 4/6 ____ models only)	1 = input 1, 4 = input 2, 5 = GND, 6 = input 3, 7 = input 4, 8 = input 5, 9 = input 6
IR controller module .....	Extron IR 102 kit (optional)
Program control .....	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

### General

Power .....	100 VAC to 240VAC, 50/60 Hz, 20 watts, internal, autoswitchable
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount .....	Yes, with included brackets, part #70-077-03. Also under-desk mountable with optional kit #70-222-01.
Enclosure type .....	Metal
Enclosure dimensions .....	1.75" H x 17.4" W x 8.5" D (1U high, full rack wide) 4.4 cm H x 44.2 cm W x 21.6 cm D (Depth excludes connectors.)
Product weight .....	7.0 lbs (3.2 kg)
Shipping weight .....	10 lbs (5 kg)
Vibration .....	ISTA 1A in carton (International Safe Transit Association)
Listings .....	UL, CUL
Compliances .....	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF .....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE** All nominal levels are at  $\pm 10\%$

**NOTE** Specifications are subject to change without notice.

## Part Numbers

### SW AV switcher part numbers

Switcher	Part #
SW 4AV composite video and audio switcher	60-484-21
SW 4AV RCA composite video and RCA audio switcher	60-484-31
SW 4SVA S-video and audio switcher	60-484-22
SW 4SVA RCA S-video and RCA audio switcher	60-484-32
SW 6V composite video switcher	60-487-01
SW 6AV composite video and audio switcher	60-487-21
SW 6AV RCA composite video and RCA audio switcher	60-487-31
SW 6SV S-video switcher	60-487-02
SW 6SVA S-video and audio switcher	60-487-22
SW 6SVA RCA S-video and RCA audio switcher	60-487-32
SW 6A audio switcher	60-487-20
SW 6A RCA audio switcher	60-487-30

<b>Switcher (continued)</b>	<b>Part #</b>
SW 8V composite video switcher	60-482-01
SW 8AV composite video and audio switcher	60-482-21
SW 8AV RCA composite video and RCA audio switcher	60-482-31
SW 8SV S-video switcher	60-482-02
SW 8SVA S-video and audio switcher	60-482-22
SW 8SVA RCA S-video and RCA audio switcher	60-482-32
SW 8A audio switcher	60-482-20
SW 8A RCA audio switcher	60-482-30
SW 12V composite video switcher	60-483-01
SW 12AV composite video and audio switcher	60-483-21
SW 12AV RCA composite video and RCA audio switcher	60-483-31
SW 12SV S-video switcher	60-483-02
SW 12SVA S-video and audio switcher	60-483-22
SW 12SVA RCA S-video and RCA audio switcher	60-483-32
SW 12A audio switcher	60-483-20
SW 12A RCA audio switcher	60-483-30
Universal Switcher Control Program	29-031-01
SW AV switchers User's Manual	68-644-01

## Optional accessories

<b>Extron Part</b>	<b>Part #</b>
BNC male to RCA female adapter	10-264-01
KP 6 Keypad Remote Control	60-111-20
IR 102 Infrared Remote Control Kit	70-224-01

## Cables

Extron SV cable is suitable for S-video. Super High Resolution SHR 1 cable is suitable for composite video. Both these families of Extron cables have male gender connectors on both ends.

### Pre-cut cables

<b>S-video Cable</b>	<b>Part #</b>
MHR-2 SVM-M/6 (6 feet/1.8 meters)	26-316-02
MHR-2 SVM-M/12 (12 feet/3.7 meters)	26-316-03
MHR-2 SVM-M/20 (20 feet/6.1 meters)	26-316-01
MHR-2 SVM-M/30 (30 feet/9.1 meters)	26-316-04
MHR-2 SVM-M/50 (50 feet/15.2 meters)	26-316-05
MHR-2 SVM-M/75 (75 feet/22.9 meters)	26-316-06
MHR-2 SVM-M/100 (100 feet/30.4 meters)	26-316-07

## Specifications, cont'd

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Super High Resolution Cable	Part #
RG6 1/3 (3 feet/0.9 meter)	26-383-01
RG6 1/6 (6 feet/1.8 meters)	26-383-12
RG6 1/12 (12 feet/3.7 meters)	26-383-07
RG6 1/25 (25 feet/7.6 meters)	26-383-04
RG6 1/35 (35 feet/10.7 meters)	26-383-13
RG6 1/50 (50 feet/15.2 meters)	26-383-05
RG6 1/50 (75 feet/22.9 meters)	26-383-06
RG6 1/100 (100 feet/30.5 meters)	26-383-03
RG6 1/150 (150 feet/45.0 meters)	26-383-08
RG6 1/200 (200 feet/60.0 meters)	26-383-09
RG6 1/250 (250 feet/75.0 meters)	26-383-10
RG6 1/300 (300 feet/91.4 meters)	26-383-11

### Bulk cables

Super High Resolution Cable	Part #
RG6-1/500, 500'	22-098-02
RG6-1/1000, 1000'	22-098-03
BNC male RG6 crimp connectors, qty. 50	100-260-01
BNC bulkhead connectors, qty. 50 (for custom wall plates)	100-076-51

**NOTE** Bulk cable in lengths up to 5000' is available with or without connectors.



## FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

## Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,  
and Central America:**

Extron Electronics  
1001 East Ball Road  
Anaheim, CA 92805, USA

**Asia:**

Extron Electronics, Asia  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363

**Europe, Africa, and the Middle East:**

Extron Electronics, Europe  
Beeldschermweg 6C  
3821 AH Amersfoort  
The Netherlands

**Japan:**

Extron Electronics, Japan  
Kyodo Building  
16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.



**Extron Electronics, USA**  
1230 South Lewis Street  
Anaheim, CA 92805  
USA  
714.491.1500  
Fax 714.491.1517

**Extron Electronics, Europe**  
Beeldschermweg 6C  
3821 AH Amersfoort  
The Netherlands  
+31.33.453.4040  
Fax +31.33.453.4050

**Extron Electronics, Asia**  
135 Joo Seng Road, #04-01  
PM Industrial Building  
Singapore 368363  
+65.6383.4400  
Fax +65.6383.4664

**Extron Electronics, Japan**  
Kyodo Building  
16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082 Japan  
+81.3.3511.7655  
Fax +81.3.3511.7656